

REMARKS

State of the Claims

None of the claims have been amended or canceled in this response. Applicants believe that both of the rejections made by the Examiner in the previous office action referenced herein are improper and have set forth cogent remarks therefor. Applicants look forward to the Examiner's studied review of those remarks and for a notice of allowance to be issued on the claims as soon as is possible. Claims 1-14 are pending.

35 U.S.C. § 112 Rejection

Claim 5 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as their invention.

The Examiner states that the claim is unclear because of a discrepancy between the claim language and the specification.

Applicants respectfully disagree that there is a discrepancy or a lack of clarity between Claim 5 and the specification. The specification clearly states the following: "the filter particles can also be provided in complex forms such as webs, screens, meshes, non-wovens, and wovens, which may or may not be formed from the simple forms described above."¹ The language in the specification, and the language of claims are the same. Also, based on the foregoing, Applicants assert that there is no "missing" word prior to either of the terms non-wovens or wovens.

Applicants therefore respectfully request reconsideration and allowance of Claim 5 over the Examiner's 35 U.S.C. § 112, second paragraph, rejection.

35 U.S.C. § 103 Rejection

Claims 1-2 and 4-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Economy, et al. (U.S. Patent No. 5,834,114) in view of Buzzelli (U.S. Patent No. 3,650,834).

Economy '114 provides a fiber suitable for absorption of contaminants wherein the fiber is coated with a resin, the resin is cross-linked and then heated to carbonize the resin, and the coated fiber being exposed to an etchant to activate the coated fiber.

¹ Applicants' Specification, page 6, lines 24-27.

Buzzelli '834 provides a battery formed in part by the use of activated carbons that may be derived from activated petroleum coke, wood char, activated sodium lignosulfonate char, activated bituminous coal, polyvinylidene chloride char, polyacrylonitrile char and the like.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all of the claim limitations. (MPEP § 2142).

Applicants respectfully disagree with the Examiner's obviousness rejection and contend that the combination of Economy '114 in view of Buzzelli '834 does not provide a prima facie case of obviousness.

First, there is no motivation either in the references themselves or in the knowledge generally available to one of skill in the art to combine the references. Economy '114 pertains to the creation of fibers for the absorption of contaminants either in air or water. Buzzelli '834 pertains the manufacturing of batteries. Neither reference, singly or combined, suggests one-another or Applicants use of lignosulfonate to coat carbon fibers for use in a water filter.

Also, even after the references have been improperly combined, they do not teach or suggest the benefits and unexpected results that stem from the use of coating carbon particles with lignosulfonate. Applicants point out that unexpectedly it has been found that lignosulfonate-coated filter particles have a large amount of mesopore and/or macropore volume when carbonized and activated.² This is important because the large number of mesopores and/or macropores provide more convenient adsorption sites for the pathogens, their fimbriae, and surface polymers (e.g. proteins, lipopolysaccharides, carbohydrates and polysaccharides) that constitute the outer membranes, capsids and envelopes of the pathogens.³

Clearly, Applicants have recognized the importance of coating their fibers with lignosulfonate where such importance has escaped the attention of both Economy '114 and Buzzelli '834. Economy '114 completely misses this distinction. Buzzelli '834, although it mentions carbon derived from, and not coated by, activated sodium lignosulfonate char, is not interested in forming filters of any sort to remove contaminants from water. As such, Applicants assert that to combine Economy '114 in view of Buzzelli '834 would not yield Applicants' invention. At best, the combination would yield a process for forming a battery-powered filter

² Id. at page 6, lines 12-14.

³ Id. at page 6, lines 14-18.

wherein the lignosulfonate would reside entirely within the battery and remain outside of the filter. At worst, one of skill in the art would be compelled to apply the poisonous matter of the battery interior, placing such corrosive matter within a filter meant to clean rather than poison water flowing through the filter. Neither possibility is Applicants' invention.

In addition, Applicants respectfully assert that the combination of Economy '114 in view of Buzzelli '834 is improper as the references themselves are non-analogous.

In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.⁴ A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem.⁵

Applicants first assert that water/air filters are not in the same field as battery manufacturing. Applicants also assert that it is unreasonable to believe that one of skill in the art for the creation of water/air filters would look at the art for battery manufacturing in order to draw upon some previously undisclosed and untaught understanding that would provide Applicants' improved filter. Buzzelli '834 neither teaches or discloses any sort of filtering mechanism and although the reference teaches the use of lignosulfonate, only as one of several possible options, it neither recognizes nor teaches the benefits of said use to coat carbon particles for use in a filter to remove contaminants from water nor provided any understanding of the unexpected results thereof.

Furthermore, Applicants assert that Applicants' invention produces heretofore unexpected results neither contemplated nor taught by Economy '114 in view of Buzzelli '834. Evidence of unexpected results must be weighted against evidence supporting prima facie obviousness in making a final determination of the obviousness of the claimed invention.⁶

As noted herein above, Applicants, in their use of lignosulfonate as a coating to their carbon fibers, have produce heretofore unexpected results for the absorption of contaminants out of water.⁷ Economy '114 in view of Buzzelli '834 does not teach or suggest these results, and

⁴ In re Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992); See also In re Deminski, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986).

⁵ In re Clay, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992); See also Wang Laboratories Inc. v. Toshiba Corp., 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993).

⁶ In re Soni, 54 F.3d 746, 34 U.S.P.Q. 2d (BNA) 1684.

⁷ Applicants' Specification, page 6, lines 12-18.

the references therefore fail to establish a prima facie case of obviousness in view of Applicants' invention.

Thus, Applicants respectfully request reconsideration and allowance of Claims 1-2 and 4-12 over the Examiner's 35 U.S.C. § 103(a) rejection.

Claims 13 and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Economy '114, in view of Buzzelli '834 and further in view of Buelow, et al. (U.S. Patent No. 6,006,797).

Applicants note that Claims 13 and 14 depend from Claim 1. Applicants also note that since Claim 1 is nonobvious over Economy '114 in view of Buzzelli '834 for all of the reasons stated herein above, Claims 13 and 14 cannot properly be held to be obvious due to the addition of Buelow '797 to the combination of references.

Thus, Applicants respectfully request reconsideration and allowance of Claims 13 and 14 over the Examiner's 35 U.S.C. § 103(a) rejection.

SUMMARY

The rejections in the Office Action have been discussed and, Applicants believe, the proper reasoning and arguments as based upon the law have been set forth to address the rejections.

In light of the discussions contained herein, Applicants respectfully request reconsideration of the rejections and their withdrawal.

Issuance of a Notice of Allowance at an early date is earnestly solicited.

Respectfully submitted,
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